

IN THE DRAWINGS

Applicant requests amendment to Figure 1 as shown enclosed merely to label this drawing as prior art. All of the other figures are included here although they are not amended.

REMARKS

Pending were Claims 1-22. The Examiner indicated that Claims 6 and 15 were merely objected to and otherwise allowable. Claims 1-5, 7-14 and 16-22 stand rejected.

Specifically, Claims 1-5, 7-14 and 16-22 stand rejected under 35 U.S.C. §103 as unpatentable over the admitted prior art in view of US Patent No. 4,764,732 to Dion et al, hereinafter Dion. The Examiner stated in pertinent part:

However AAPA fails to disclose a switch coupling one of the second and third amplifier where the second and third attenuator between the first and second amplifier stages and an output terminal the optical receiver. Dion, from the same field of endeavor also discloses an optical receiver (column 1, lines 5-6) wherein a second amplifier is switch-able between two modes (column 1, lines 57-62) wherein a switch means switches and impedance in and out of the circuit (column 2, lines 7-10) in order to operate the amplifier in its first and second modes (column 2, lines 10-15). It is important to note that Dion teaches its set switching means can switch to reduce the second amplifier or to shut off the second amplifier completely while in the second mode (column 2, lines 37-44) effectively coupling a resistor while also de-coupling an amplifier. Therefore it would have been obvious to one of ordinary skill in the art to replace the variable attenuators with the switching modes as taught by Dion into the second and third amplification stages as taught by AAPA at the time of invention,...

The Examiner indicated that Claims 6 and 15 were merely objected to but otherwise allowable. The Examiner is thanked for his indication of allowable subject matter. However since all the present rejections are traversed, no attempt has been made to put Claims 6 and 15 in independent form.

Note that Claim 1 is amended here only to insert the word "either" in the final clause of the claim. This is not intended as narrowing but is merely a clarification and conforms Claim 1 to method Claim 12 which recites "coupling one of the stages to either amplify or attenuate an input signal..." Claim 1, even without this amendment, is clear that the switch recited in the final clause of Claim 1 couples "one of the second amplifier or the second attenuator". Thus the insertion of

“either” is merely clarification. The amendment to Claim 2 improves punctuation and is merely a matter of form. None of the amendments here are intended for reasons of patentability or are responsive to any rejection and not intended to narrow the claims.

New Claims 23 and 24 added here are discussed below.

As the Examiner clearly understands from his rejection, with respect to Figure 2 illustrating a circuit in accordance with the invention, switches S1 and S2 operate to connect either the attenuator 40, which is a fixed attenuator, or the amplifier A224 in line. At any one time only one of these is connected. Also, at any one time one of them is indeed connected and there is no bypassing of the amplifier stage which includes attenuator 40 and amplifier 24. Thus as pointed out in the specification, switches S1 and S2 are single pole double throw switches, as are switches S3 and S4. (Note that the amendment here to the specification, paragraph 20, is merely to correct a typographically error and conforms paragraph 20 to paragraph 13, which is specific about the single pole double throw switches.) As pointed out in the Summary in paragraph 13 with this arrangement “The RF signal path is redirected when the reduction of gain is close to the gain of the amplifier. By directing the RF signal path, excessive noise and distortion due to unwanted gain and loss are eliminated and consequently, the NPR (noise power ratio) dynamic ranges increase.”

The arrangement shown in Figure 2, upon which Claim 1 reads, is not the same as the Dion reference. This is acknowledged by the Examiner since he rejected Claim 1 citing Dion in combination with present Figure 1. The Dion arrangement is different in several respects. First, in Dion Fig. 1, while there are two amplifier stages, the first stage includes only amplifier 25 and the second stage includes a variable gain inverting amplifier 31 and the ordinary amplifier 33. It is assumed that the Examiner is taking the variable gain inverting amplifier 31 to be the “attenuator” as recited in the present claims although this is not clear. It is clear, from Dion how this operates, see Dion column 2, beginning line 30:

As a result in a change in the bias voltage applied to the second amplifier means the gain of the second amplifier means is substantially reduced or the second amplifier means may be switched

off in its second mode of operation. As a result, the amplifier of the present invention changes from a transimpedance amplifier having a good sensitivity over broad bandwidth operation to a follower amplifier of improved dynamic range.

Further, see Dion column 3, beginning line 48:

Also, the DC bias potential applied through the first amplifier means 25 to variable gain amplifier 31 changes when resistor 19 is switched into circuit. By changing the bias voltage applied to the variable gain amplifier 31, the gain of amplifier 31 may be reduced effectively reducing feedback through resistor 17 or the amplifier 31 may be turned off. In the event amplifier 31 is turned off, the output signal is taken at V_o'' . (Emphasis added.)

Hence amplifier (variable gain inverting amplifier) 31 is switched on or off or partly turned on. Moreover when it is turned off its amplification is nil, since the signal bypasses completely both the variable gain amplifier 31 and amplifier 33 and the output signal as shown in Dion Fig. 1 is taken off at V_o'' which is before the input terminal of variable gain inverting amplifier 31. Hence the amplifier stage which includes variable gain inverting amplifier 31 and amplifier 33 is completely bypassed in this mode.

In other words, in Dion Fig. 1 there are two modes of operation, in the first mode only the first amplifier 25 is operating and the second amplifier stage, including 31 and 33, is bypassed. In the second mode both amplifier 25 and the second amplifier stage, including components 31 and 33, is in use and amplifying at least to some extent.

As the Examiner acknowledges this is not at all the same as in accordance with the present invention where instead, see present Fig. 2, either attenuator 40 or amplifier 24 propagate the signal at any one time. Switches S1 and S2 operate to switch in either attenuator 40 or amplifier 24. Thus these are two components effectively connected in parallel by the switches so at any one time only one is actually connected in the circuit.

Hence even the combination of Dion with the prior art of present Fig. 1 fails to meet Claim 1. The combination as suggested by the Examiner results in switching the second amplifier

stage completely in or out of the circuit. Hence the teaching of Dion when applied to present Fig. 1 would result in the second amplifier stage of present Fig. 1, which includes amplifier 28 and variable gain attenuator 30, being switched in or out which means that when the second stage is switched out the output signal would be the output signal from the first stage attenuator 26. In other words, Dion teaches switching the second amplifier stage in or out (or having it partially in). At no point does Dion suggest alternately using the amplifier or attenuator. He especially does not suggest using an amplifier or a fixed attenuator as shown in present Fig. 2.

Hence it is respectfully submitted that even the cited combination fails to meet the final clause of Claim 1 “a switch coupling either one of the second amplifier or the second attenuator between the first amplifier stage and an output terminal of the optical receiver.” Instead the combination as suggested by the Examiner results in a switch coupling both the second amplifier and the second attenuator in or out of the circuit together, where they are connected in series.

However, such teachings do not meet Claim 1 and hence Claim 1 distinguishes over even the combination of references.

Moreover as pertains to Claim 10, even the cited combination fails to meet Claim 10 for an additional reason. Dion teaches that in the second stage there is variable gain inverting amplifier 31 followed by the ordinary amplifier 33. Assuming arguendo that variable gain inverting amplifier 31 is a variable attenuator, it is just that a variable attenuator. In that sense it is the same as the second stage shown in prior art present Fig. 1 which has amplifier 28 and variable attenuator 30. There is no fixed attenuator here. Instead, Claim 10 recites that “the second attenuator is a fixed attenuator.” Of course no such device is shown in Fig. 1 of the present application or in Dion and hence Claim 10 additionally distinguishes over the references for this reason.

Claim 12 while not the same as Claim 1 does recite in its final clause “coupling one of the stages to either amplify or attenuate an input signal from the photodetector...” No such act is suggested even by the combination of present Fig. 1 and Dion, which as pointed out above instead if combined result in the second stage being disconnected completely rather than “to either amplifier

or attenuate.” Hence for at least this reason Claim 12 distinguishes over even the combination of references cited by Examiner. Claim 19 dependent on Claim 12 is similar to Claim 10 and hence additionally allowable for at least the same reasons as pertained to Claim 10 as pointed out above.

New dependent Claims 23 and 24 are added here which are directed to similar subject matter and respectively depend on Claims 1 and 24 and hence allowable for at least the same reasons as the base claims. Further, each of Claims 23 and 24 recites “the switch is a single pole double throw switch...” “and further comprising a second single pole double throw switch coupling either one of the second amplifier or the second attenuator to the output terminal.” Hence Claim 23 reads on Fig. 2 which shows that each stage has two associated switches, for instance the stage including attenuator 40 and amplifier 24 is coupled by switches S1 and S2, each being a single pole double throw switch, thus providing the parallelism in the circuit pointed out above. Nothing like that is shown in Dion or in present Fig. 1. At most Dion has a single switch in series to connect or disconnect the second stage. There is no possibility or suggestion in Dion of two switches allowing the amplifier and attenuator to be coupled alternately. Hence Claim 23 and 24 are additionally allowable over the references for this reason.

CONCLUSION

Therefore it is respectfully submitted that all pending Claims 1-24 are allowable, and allowance is requested. If the Examiner contemplates other action, please contact the undersigned at the telephone number given below. In the event that a time extension or other fees are needed please charge same to Deposit Account No. 03-1952 referencing docket no. **490102001500**.

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Respectfully submitted,

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